

Two Poles, No Matter What Planet:
Potential Solutions to The Widening Gap Between the US and China in Outer Space Affairs

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Abstract

The fraught state of contemporary US-China relations has extended into space affairs, and threatens to plunge outer space into a perpetually militarized domain. The key question this paper seeks to address is: How can the US and China avoid military competition in space and begin to cooperate, or later even collaborate, in space affairs? This paper addresses this question by using qualitative and historical analysis rooted in neoliberal theory of science diplomacy applied to current spheres of influence and institutions in space affairs. It offers a two-stage approach linking civil science with space affairs to circumvent the militarization of space and chart a course towards greater cooperation and collaboration. Not only would this path potentially prevent outright conflict in space, but it could provide immense benefits for humankind both now and in the future.

“We set sail on this new sea because there is new knowledge to be gained, and new rights to be won, and they must be won and used for the progress of all people. For space science, like nuclear science and all technology, has no conscience of its own... There is no strife, no prejudice, no national conflict in outer space as yet. Its hazards are hostile to us all. Its conquest deserves the best of all mankind, and its opportunity for peaceful cooperation may never come again.”¹

—John F. Kennedy

¹ John F. Kennedy, “Address at Rice University on the Nation’s Space Effort,” September 12, 1962, Rice University, Houston, United States of America, MPEG-4, 18:27, <https://www.jfklibrary.org/learn/about-jfk/historic-speeches/address-at-rice-university-on-the-nations-space-effort>.

Introduction

Just over fifty years since President Richard Nixon first visited China, US-China bilateral relations have reached an untenable state, with disagreements on a variety of issues extending from domestic public opinion to intergovernmental communication.² Despite recent trips to China by Secretary of State Antony Blinken, Secretary of the Treasury Janet Yellen, and Secretary of Commerce Gina Raimondo, which resulted in progress towards stabilization of relations,³ there is still much ahead for the world's two preeminent superpowers to sort out before embarking on a path of sustained de-escalation of tension. The relationship between the US and China, the two largest economies in the world, hardly affects only the two states directly involved.⁴ There are no significant areas of global dialogue that are not affected by the US, China, or the relationship between them. Governments and populations around the world, therefore, have a vested interest in stable relations between the US and China.

Developments in outer space endeavors provide an invaluable lens to see how a volatile relationship between the US and China will impact the modern arena of international affairs, with its own aura of unpredictability. Space activities are already fundamental to many aspects of international relations, having broad applications for military, private sector, civilian science/academia and long-term plans for the future of humanity.⁵ The US and the PRC, with the two largest and most robust space programs in the world, are crucial to how humanity as a whole

² Ian Prasad Philbrick, "If Biden Wanted to Ease U.S.-China Tensions, Would Americans Let Him?" *The New York Times*, June 27, 2023, <https://www.nytimes.com/2023/06/27/upshot/us-china-cold-war.html>.

³ Andrea Shalal, "Yellen sees 'progress' in rocky US-China ties, expects more communication," *Reuters*, July 9, 2023, <https://www.reuters.com/world/yellen-says-china-us-have-significant-disagreements-that-must-be-communicated-2023-07-09/>.

⁴ Shalal.

⁵ Mercy Kuo, "Wargaming the China-US Space Race," *The Diplomat*, June 7, 2021, <https://thediplomat.com/2021/06/wargaming-the-china-us-space-race/>.

will fare in its endeavors into outer space. Even though the Sino-American bilateral dynamic in space is still at an early stage, it has already been described as a new “space race” bordering on hostility stemming from conflicting interests.⁶

The key question this paper seeks to address is: How can the US and China avoid conflict in space and begin to cooperate, and perhaps even collaborate, in space affairs? Cooperation here is defined as maintaining communication channels and coordination regarding space affairs while each state carries out individual initiatives, while collaboration entails the added component of joint-venture projects. In order to explore this question, this paper first examines the history of both American and Chinese endeavors into space and their respective programs, as well as their relationship and plans over time. This background section also includes details on the dynamic between the US and the Soviet Union during the latter half of the twentieth century in outer space affairs as a relevant case study for two geopolitical rivals expanding their presence in outer space. Then, this paper will analyze the broad array of current challenges, explaining why the potential for lessening hostility in space affairs between the US and China is a daunting task, requiring immediate solutions. Lastly, it will propose concrete steps, through a neoliberal two-stage framework, that the US and China could each take to make both science and space a more collaborative frontier between them. In doing so, this paper seeks to illustrate the feasibility and enormous potential for space and the scientific endeavor to cool tensions between the US and China in general, make the domain of outer space peaceful both now and hereafter, and help to address larger problems facing humanity that demand innovation.

Historical Background

⁶ David Ignatius, “China is serious about winning the new space race,” *The Washington Post*, July 20, 2023, <https://www.washingtonpost.com/opinions/2023/07/20/china-united-states-space-competition/>.

The first modern advancements in rocketry and satellite technology grew directly out of the military-dominated World War II and early Cold War periods. The October 1957 launch of Sputnik 1 by the Soviet Union motivated a political narrative in the United States emphasizing inferiority in space-related technological capability and thereby galvanized the country into addressing these perceived shortcomings.⁷ Space enthusiasts also intelligently utilized national security concerns and popular fears of the nuclear age to win support.⁸ NASA was established in 1958 out of this crystallized spike of political will.⁹ In the words of space historian Michael Neufeld, “Creating a civilian space agency was an American Cold War solution to the organizational, but also the political, challenges of the rapidly escalating race... A civilian and scientific space agency, with international cooperation written into its founding legislation, would project a positive American image to allies in Western Europe and elsewhere. By creating NASA, the United States also effectively invented the category of civilian space activity, as heretofore only the armed services possessed the technologies that made spaceflight possible.”¹⁰ Of course, the idea that all American space activities were run by NASA is an illusion, as military space programs persisted in their pursuits for military applications of space endeavors.¹¹ In contrast, the Soviet Union’s space program was shrouded in secrecy as a part of the military.¹² Thus began the “space race” between the US and the USSR, with a back-and-forth dance of both space “firsts” in the public view as well as militaristic innovations behind closed doors. The goal of landing men on the moon provided the Apollo “boom” of transformational funding for NASA,

⁷ Ted Spitzmiller, *The History of Human Spaceflight* (Gainesville: University Press of Florida, 2017), 129.

⁸ Howard McCurdy, *Space and the American Imagination* (Baltimore: The Johns Hopkins University Press, 2011), 72.

⁹ Spitzmiller, 135.

¹⁰ Michael J. Neufeld, *Spaceflight: A Concise History* (Cambridge: The MIT Press, 2018), 48-49.

¹¹ Neufeld, 51.

¹² Neufeld, 51.

quintupling its budget to \$5 billion by 1966.¹³ Once the goal had been accomplished in 1969, other national concerns drained public and political support and NASA's budget fell sharply in the mid-1970s, killing proposals for a new space station and Mars expeditions.¹⁴ As Neufeld puts it, "Thus the forces of war and international competition, which had repeatedly accelerated rocket and space technology development, suddenly slackened."¹⁵

Concurrently, China's space endeavors were just beginning to lift off. China as a civilization has a long history of technological innovation and invention, and is often said to be the original birthplace of rocket technology.¹⁶ Its tumultuous path to becoming a nation-state, however, meant that it would be a relative latecomer to reaching outer space. Indeed, China was not a factor in the space race mainly due to a lack of resources, as well as the constraining impact of governmental change and political movements in the 1950s and 1960s on technological development.¹⁷ In intermittent periods of relative stability, accomplished scientists of Chinese descent returned from abroad and began to develop the domestic space-oriented scientific community.¹⁸ Most notable of these individuals was Qian Xuesen, a brilliant aerospace engineer and California Institute of Technology professor who was persecuted under McCarthyism in the 1950s and eventually deported back to China.¹⁹ In the words of former US Navy Secretary Dan Kimball, "It was the stupidest thing this country ever did. He was no more a communist than I

¹³ Neufeld, 56.

¹⁴ Joan Hoff, "The Presidency, Congress and the Deceleration of the US Space Program," in *Spaceflight and the Myth of Presidential Leadership*, eds. Roger Launius and Howard McCurdy (Illinois: University of Illinois Press, 1997), 92-132.

¹⁵ Neufeld, 62.

¹⁶ Jimmy Stamp, "The History of Rocket Science," *Smithsonian Magazine*, February 2013, <https://www.smithsonianmag.com/innovation/the-history-of-rocket-science-4078981/>.

¹⁷ James Moltz, *Asia's Space Race: National Motivations, Regional Rivalries, and International Risks* (New York: Columbia University Press, 2012), 70.

¹⁸ Roger Handberg and Zhen Li, *Chinese Space Policy: A Study in Domestic and International Politics* (New York: Routledge, 2007), 68-69.

¹⁹ Richard Brownell, *Space Exploration* (Detroit: Lucent Books, 2012), 82.

was, and we forced him to go.”²⁰ Qian, who initially did not want to return to China from the US,²¹ ended up becoming the “father of the Chinese space program.”²² Top leaders such as Liu Shaoqi, Zhou Enlai and Lin Biao pushed to keep rocketry and satellite research alive during the Cultural Revolution, a tumultuous decade marked by widespread chaos and violence.²³ So in 1970, China successfully launched its first satellite, “Dong Fang Hong 1” (“The East is Red 1”), with military backing and under the leadership of Qian Xuesen.²⁴

In line with his economic reforms, Deng Xiaoping aimed to kickstart Chinese space endeavors through enabling more international scientific dialogue.²⁵ This process marked the beginning of US-China relations in the field of space endeavors. The late 1970s saw delegations of Chinese and American scientists meeting with ever-higher frequency as a byproduct of the ongoing process of the normalization of relations.²⁶ In 1978, the US and China reached an “Understanding on Cooperation in Space Technology,” which established several working groups and a joint commission, and sparked several proposals for the Chinese purchase of US space technology.²⁷ During Deng’s momentous visit to the US the following year, the first ever official visit by a paramount leader of China, he toured the Johnson Space Center in Houston, operating the controls on a Space Shuttle simulator and climbing on top of an Apollo 11 lunar

²⁰ Bradley Perrett, “Qian Xuesen Laid Foundation For China’s Space Rise,” *Aviation Week*, January 7, 2008, <https://aviationweek.com/qian-xuesen-laid-foundation-chinas-space-rise>.

²¹ Fraser MacDonald, “The blunder that could cost the U.S. the new space race,” *The Washington Post*, June 26, 2019, <https://www.washingtonpost.com/outlook/2019/06/26/blunder-that-could-cost-us-new-space-race/>.

²² Perrett.

²³ Moltz, 79.

²⁴ Michael Wines, “Qian Xuesen, Father of China’s Space Program, Dies at 98,” *The New York Times*, November 3, 2009, <https://www.nytimes.com/2009/11/04/world/asia/04qian.html>.

²⁵ Moltz, 82.

²⁶ Moltz, 83.

²⁷ Brian Harvey, *China’s Space Program: From Conception to Manned Spaceflight* (New York: Springer, 2004), 191.

rover.²⁸ In order to counter the Soviet Union's once again rising space credibility, the US offered China a slot on a Space Shuttle flight.²⁹ While this never materialized (mainly due to the 1986 Challenger disaster) two Chinese scientific experiments ended up flying on a Space Shuttle mission in 1992.³⁰ In order for American satellites to launch on Chinese rockets, China was required to agree to numerous liability agreements and technology safeguards, as well as to the 1967 Outer Space Treaty and two more United Nations conventions on damage liability and space object registration.³¹ As described by professor James Moltz of the Department of National Security Affairs at the Naval Postgraduate School, "these steps marked a major shift in China's integration into the world space community and its growing acceptance of international norms."³² Of course, at this time space was not the militarized domain that it is now, and overall US-China relations were in a more amicable position.

The US-Soviet space relationship was also going through new dynamics in the mid-1970s, a time in which "competition went on... in moderated form."³³ On the one hand Washington and Moscow exhibited cooperation with the 1975 Apollo-Soyuz missions but simultaneously enhanced space militarization measures, establishing a "de facto regime where space was militarized but not weaponized."³⁴ In other words, the handshake between cosmonauts and astronauts in orbit was only a superficial symbol of détente in space, and "Apollo-Soyuz in no way lowered the possibility for military conflict in space or on Earth."³⁵ Concurrently, space

²⁸ Walter A. McDougall, "The Scramble for Space," *The Wilson Quarterly* 4, no. 4 (1980): 80.

²⁹ Moltz, 84.

³⁰ Moltz, 84.

³¹ Moltz, 85.

³² Moltz, 85.

³³ Neufeld, 63.

³⁴ Neufeld, 63.

³⁵ Aaron Bateman, "The prospects for United States–China space cooperation are limited," *The Bulletin*, June 12, 2023, <https://thebulletin.org/2023/06/the-prospects-for-united-states-china-space-cooperation-are-limited/>.

activity was no longer limited to a bipolar dynamic. Many Western European states as well as India and China were engaging in space activities.³⁶ The bipolarity once again took the spotlight, however, in the mid- to late 1980s with hostile rhetoric between the US and the Soviet Union, imbued with threats to weaponize space as defense from the other, exhibited in President Ronald Reagan's 1983 "Star Wars" speech which supported a space-based missile defense system.³⁷ But after the Soviet Union collapsed in 1991, it took with it the space race and much, but not all, of the motivation for American spending on civilian space endeavors.³⁸ While NASA's budget gradually declined through a reform period in the 1990s, "the degree to which American space science continued to prosper indicates that it had created its own institutional and political momentum"³⁹ as a legacy of the space race.

China adapted accordingly in the new global space environment, which was no longer starkly bipolar. In order to facilitate as much international cooperation as possible under a "civilian" banner, it established the China National Space Administration (CNSA) in 1993, although most of its space research and capability development still took place in the defense sector.⁴⁰ China signed a formal space cooperation agreement with Russia as well in 1994, beginning a long economic partnership in space technology.⁴¹ By 1999, China had not only launched 26 US satellites, but also a few from Pakistan, Sweden, Australia and many more European nations.⁴² It is clear that cooperation and collaboration in space affairs was also a means for China itself to spark further technological development.

³⁶ Neufeld, 64.

³⁷ McCurdy, 88.

³⁸ Neufeld, 70.

³⁹ Neufeld, 100.

⁴⁰ Moltz, 88.

⁴¹ Moltz, 88.

⁴² Moltz, 89.

Cracks began to appear in US-China space cooperation following a series of Chinese rocket booster explosions in the 1990s, which led to Congressional scrutiny of cooperation between a US satellite firm and Chinese officials.⁴³ In 1999, the House of Representatives' Cox Committee found that these relationships amounted to espionage, because China gained access to weapons design technology and intelligence, and fined the American firms involved for unsupervised communication with Chinese space officials.⁴⁴ Many critics, however, called these charges too broad and argued that the relevant information was not sensitive.⁴⁵ Regardless, Congress passed legislation later that year that recategorized all space technology as "munition items" under the US International Traffic and Arms Regulations, thereby halting all space cooperation with China.⁴⁶ Over the following 15 years, China began to simultaneously build its infrastructure for military space operations and take issue with the US in international forums regarding the increasing "weaponization of space."⁴⁷ It is in this timeframe that China and the US began to diverge in space affairs. In 2003, China successfully launched its first person into space, becoming the third nation to achieve human spaceflight, shocking the world.⁴⁸ In 2006, China outlined a lunar exploration program and updated its space station plan.⁴⁹ As China simultaneously grew its independent capabilities in space as well as joint agreements with other space programs, the US and China failed to reestablish ties in space affairs due to international and domestic political factors.⁵⁰ Congress clashed with NASA administrators traveling to China,

⁴³ Moltz, 90.

⁴⁴ Alastair Iain Johnston et al, "The Cox Committee Report: An Assessment," Stanford Center for International Security and Cooperation, 1999, 9, https://cisac.fsi.stanford.edu/publications/cox_committee_report_the_an_assessment.

⁴⁵ Johnston et al, 21.

⁴⁶ Moltz, 90.

⁴⁷ Moltz, 92.

⁴⁸ Neufeld, 180.

⁴⁹ Moltz, 94.

⁵⁰ Moltz, 95.

and simultaneously China's CNSA and People's Liberation Army reportedly had disagreements regarding foreign access to military-controlled facilities.⁵¹

In 2011, Congress passed the Wolf Amendment which requires approval of Congress and the FBI for NASA to engage directly in any bilateral manner with the CNSA or any China-affiliated organization, drawing on the findings of the Cox Committee and espionage concerns, as well as the pervasive view in Washington that China "view[s] space power as one aspect of a broad international competition in comprehensive national strength and science and technology."⁵² As a result, China was not permitted to join the International Space Station project, which former astronaut and NASA Administrator Charles Bolden claims went against the wishes of other allied partners and was a missed opportunity to reestablish ties.⁵³ Interestingly, the ISS has been a project where "United States cooperation with Russia in crewed spaceflight has endured despite a marked deterioration in relations. In part... due to the fact that the American and Russian components of the space station are interdependent."⁵⁴ In 2013, NASA barred Chinese scientists, even those working at US institutions, from attending a conference at a NASA facility, leading to a boycott by American scientists in protest.⁵⁵ Though it was clarified that NASA had misinterpreted the Wolf Amendment as applying to all individual Chinese nationals, the damage had been done.⁵⁶ While there have been legitimate reasons for the US to be wary of engaging directly with China on matters of technology, the resulting policy

⁵¹ Moltz, 96.

⁵² Jeffrey Kluger, "The Silly Reason the Chinese Aren't Allowed on the Space Station," *TIME*, May 29, 2015, <https://time.com/3901419/space-station-no-chinese>.

⁵³ Jacqueline Feldscher, "Biden space advisers urge cooperation with China," *Politico*, December 20, 2020, <https://www.politico.com/news/2020/12/20/biden-china-space-448529>.

⁵⁴ Bateman.

⁵⁵ Ian Sample, "Nasa admits mistake over Chinese scientists' conference ban," *The Guardian*, October 11, 2013, <https://www.theguardian.com/science/2013/oct/11/nasa-chinese-scientists-conference-ban>.

⁵⁶ Sample.

decisions seem to have done no more than inflame rhetoric and encourage China to develop space capabilities in isolation. US rhetoric has since been generally increasingly hostile towards Chinese space endeavors, encapsulated in a 2015 University of California, San Diego Institute on Global Conflict and Cooperation report ending with a zero-sum conclusion: “China’s efforts to use its space program to transform itself into a military, economic, and technological power may come at the expense of US leadership and has serious implications for US interests.”⁵⁷

“Control of space means control of the world,” in the words of former President Lyndon Johnson.⁵⁸ It seems now that such a mindset has overtaken American and Chinese competing visions and plans in outer space. In 2021, China and Russia agreed to work together on an International Lunar Research Station (ILRS) rather than joining the US Artemis lunar program.⁵⁹ The US and China’s separately announced proposals for lunar landing sites overlap.⁶⁰ NASA administrator Bill Nelson warned that China might start claiming lunar territory “under the guise of scientific research.”⁶¹ China’s *Tiangong* space station will be the only space station in operation after the decommissioning of the ISS at the end of the decade. It is unlikely that US-China collaboration in low earth orbit will occur then as *Tiangong*’s production itself was precipitated by exclusion. According to a *Tiangong* designer, “The long-term foreign blockade forced our independent innovation. We must have our own. We cannot always run behind

⁵⁷ Kluger.

⁵⁸ McCurdy, 83.

⁵⁹ Namrata Goswami, “The Strategic Implications of the China-Russia Lunar Base Cooperation Agreement,” *The Diplomat*, March 19, 2021, <https://thediplomat.com/2021/03/the-strategic-implications-of-the-china-russia-lunar-base-cooperation-agreement>.

⁶⁰ Andrew Jones, “NASA and China are eyeing the same landing sites near the lunar south pole,” *SpaceNews*, August 31, 2022, <https://spacenews.com/nasa-and-china-are-eyeing-the-same-landing-sites-near-the-lunar-south-pole/>.

⁶¹ “China is unusually secretive about its space programme,” *The Economist*, May 18, 2023, <https://www.economist.com/china/2023/05/18/china-is-unusually-secretive-about-its-space-programme>.

others.”⁶² China has also made a “deliberate effort to offer different capabilities from other nations’ space programs” as a means to compete, exhibited by their creating the world’s largest radio telescope and being the first nation to land on the far side of the moon: “They decided not to try to compete with the US in terms of drawing partners away from us, but instead by offering different opportunities than we are,” wrote Joan Johnson-Freese, a professor at the Naval War College.⁶³ Finally, it appears that both China and the US are increasing military capacities in space while communicating strong displeasure at the actions of the other.⁶⁴ Fraser MacDonald aptly summarizes the history of US-China space relations from Qian Xuesen to now: “The [US] impulse to undertake diplomatic hostility, to engage in antagonistic competition rather than cooperation in space, produced precisely the outcome it purported to avoid. Instead of stifling China’s space program, it dramatically accelerated it.”⁶⁵ The lens of offensive realism, arguing that “the desire for power in space for states’ hegemony has led to a security dilemma between [the] United States and China” seems to be particularly relevant to the current dynamic.⁶⁶ Here, space becomes reduced to another arena of bilateral competition, and the militarization of space is thereby both symptomatic of such competition and a driver of it. It is clear that the paths being followed by the US and China in space are on the path to possible collision, and there is a need for drastic course correction.

Challenges

⁶² Andrew Kramer and Steven Lee Myers, “Russia, Once a Space Superpower, Turns to China for Missions,” *The New York Times*, June 15, 2021, <https://www.nytimes.com/2021/06/15/world/asia/china-russia-space.html>.

⁶³ Feldscher.

⁶⁴ Bateman.

⁶⁵ MacDonald.

⁶⁶ Rubab Nawaz, Asma Bilal, and Maria Rehman, “United States-China Space Offensive: A Dangerous Competition,” *Astropolitics* 20, no. 1 (2022): 27.

The hope for US-China space cooperation, much less collaboration, is uncertain for a variety of reasons relating both to political barriers and logistical challenges. The two core challenges fall under the logistical (requiring difficult adaptation) and political (requiring shifts in policy) categories. Of course, the logistical challenge is only surmountable once political will is activated and resources are thereby appropriately allocated. As such, the core challenge is that the ongoing, inevitably increasing militarization of space has made it such that any technology or resources in general meant for use in outer space environments can be considered “dual use.”

Fundamentally, any convergence in space affairs would require a realignment on the uses of technology and organizational norms. A Chinese space scientist, Yi Zhou, said that the potential for civil space cooperation between the US and China is lessened by a fundamental organizational mismatch, saying, “China’s civil space program is organized differently from that of the USA. Although CNSA is the Chinese national space agency, it does not have its own research institutes, as does NASA... There is no obvious way to jumpstart actual cooperation in a short period of time.”⁶⁷ The structures and bureaucracies responsible for Chinese affairs in space are not mirrors of those in the United States, meaning that overcoming barriers would require restructuring alignments in some ways, potentially involving technology use as well. The daily tasks that members of both programs undertake, then, would need to be designed to be compatible in some sense. Prior Sino-US space cooperation got around this issue by being highly compartmentalized based on the starkly differing abilities of each state, a situation which no longer holds. Here it is also possible to see how tradition and culture differences may cause larger issues at the individual level. As Paul Szymanski, a veteran analyst of space warfare states,

⁶⁷ Moltz, 105.

“the Chinese are starting from scratch” and are therefore not “hindered by long space traditions.”

⁶⁸ The time it would take to observe, learn and adapt from both sides of the divide would be an enormous undertaking but a necessary one for substantial and sustainable cooperation to occur.

From a broader perspective, it is reasonable to assert that the only question regarding space militarization worth asking is not whether it is happening, but rather to what extent that it is. Space, as a domain only accessible through technology available to powerful states and organizations, is subject to the interests of powerful actors on the world stage. These powerful actors have made clear, as have rising space powers, that the pace of space militarization is unlikely to slow down. In 2019, President Donald Trump announced in the run up to establishing the Space Force, “Space is a war-fighting domain, just like the land, air, and sea.”⁶⁹ That same year, the head of the Russian space agency, Roscosmos, said militarization of space is inevitably moving ahead “slowly but surely.”⁷⁰ Arup Dasgupta, a geospatial academic and member of India’s space policy community, argues that because “the militarization of Space is undesirable but inevitable... India must establish its place at the high table and ensure that Space is used for defense and not offence.”⁷¹ China appears to have been more measured in its public comments, but is nevertheless adeptly militarizing commercial space technology and showing a lack of

⁶⁸ William J. Broad, “How Space Became the Next ‘Great Power’ Contest Between the U.S. and China,” *The New York Times*, January 24, 2021, <https://www.nytimes.com/2021/01/24/us/politics/trump-biden-pentagon-space-missiles-satellite.html>.

⁶⁹ Andrew Buncombe, “Trump hails space as ‘next war-fighting domain’ as he launches US Space Command,” *The Independent*, August 29, 2019, <https://www.independent.co.uk/news/world/americas/us-politics/trump-space-force-war-fighting-speech-white-house-press-conference-a9084601.html>.

⁷⁰ “Militarization of space is inevitable, Roscosmos head says,” *TASS Russian News Agency*, August 30, 2019, <https://tass.com/science/1075695>.

⁷¹ Arup Dasgupta, “Militarization of Space is Undesirable but Inevitable,” *GeoSpatial World*, August 10, 2022, <https://www.geospatialworld.net/prime/prime-opinion/militarization-of-space-is-undesirable-but-inevitable/>.

concern for ramifications.⁷² All of these states have now successfully tested antisatellite weapons. Regarding ground conflict, Ukraine's representative at the UN Disarmament Committee in October 2022 alleged, "the Russian Federation used space military technology to [pursue] its goal of exterminating Ukraine."⁷³ Space affairs are now, it seems safe to say, inextricably tied to military ambitions.

Politically, the appetite for cooperation between these states on any technological matters is low due to resulting dual-use technology concerns stemming from the militarization of space. Dual-use technology is technology that can be used for both civilian and military purposes, and in international relations poses major challenges for designing regulation, agreeing on limitations, and making assertions about the true nature of resources. This is an issue that has historically been and remains the main roadblock to cooperation in space affairs between states with a contentious relationship. At the June 3, 1961 introductory luncheon before the Vienna Summit, Soviet Premier Nikita Khrushchev's main response to US President John F. Kennedy's joint lunar mission proposal was that he was "cautious because of the military aspect of such flights," according to a State Department memo, later confirmed by a conversation in which Khrushchev reportedly said to his son, "If we cooperate, it will mean opening up our rocket program to them. We only have two hundred missiles, but they think we have many more."⁷⁴ Both now and then, states have never drawn firm and unchanging distinctions between their space and military affairs. Thus, space technology has an inherent dual-use nature which makes

⁷² Sandra Erwin, "Defense intelligence report: China in steady pursuit of space capabilities to outmatch U.S.," *SpaceNews*, January 16, 2019, <https://spacenews.com/defense-intelligence-report-china-on-steady-pursuit-of-space-capabilities-to-outmatch-u-s/>.

⁷³ "'We Have Not Passed the Point of No Return', Disarmament Committee Told, Weighing Chance Outer Space Could Become Next Battlefield," United Nations Meetings Coverage and Press Releases, October 26, 2022, <https://press.un.org/en/2022/gadis3698.doc.htm>.

⁷⁴ Douglas Brinkley, *American Moonshot* (New York: Harper, 2019), 278.

developments difficult to ascertain. According to Mark Hilborne, “China will aim to use space for military purposes in the same way that Western states use it: for intelligence, targeting, navigation, command, control, and communications (C3I), operating UAVs, and possibly in the future missile warning.”⁷⁵ The ubiquity of military uses of space technology poses the largest threat to cooperation, and even more to collaboration, between the US and China.

Recommendations

In order to establish any semblance of cooperation in space affairs between the US and China, both states must take concrete, intentional steps. I propose that these steps consist of a first and secondary stage approach. The first stage is for both states to lower political barriers for all kinds of international basic science cooperation and collaboration, specifically in academia and business. The second stage is to allow expressly for this existing cooperation and collaboration to extend into space affairs. This method would not only open the door to greater dialogue between the US and China to potentially lessen tensions in and of itself, but could also establish the notion that space need not be a fully militarized zone dominated by a “dual use” mentality. Space being mainly a zone of exploration and innovation would benefit not only the US and China but people around the world, by lessening military threats from outer space as well as developing new technology and sparking scientific discovery. Indeed, cooperation or collaboration in space affairs between two strategic competitors is not going to happen if the sole focus is on the military aspect. In order to overcome this obstacle, a distinction must be made between military uses of space (which all indicators show realistically are here to stay) and scientific/peaceful uses supported by liberal frameworks. The second stage can only happen after

⁷⁵ Kuo.

the first has been accomplished to a high degree, because under a realist framework of international relations theory, collaboration is impossible as long as embarking on scientific endeavors (much less those that involve space) is seen purely as another arena for states to maximize their own power or security. Utilizing a neoliberal framework of science diplomacy, which outlines conditions for overlapping incentives for cooperation in this domain, provides the path forward.

At the first stage, China would need to improve the environment for academic discourse, shared research, and the free flow of information. Basic scientific activity simply cannot exist, much less flourish, without addressing these factors.

The domestic research environment in China faces certain challenges as a result of pressure to perpetually increase scholastic output, even potentially at the expense of quality.

China's output of research is on par with that of the US and other countries with active research communities, but it has hardly registered in international standings when it comes to cited work.

⁷⁶ Scientific journals abroad have revoked hundreds of Chinese papers for the alleged falsification of laboratory results: "Academic fraud, misconduct and ethical violations are very common in China," according to Rao Yi, a dean and professor at the Peking University School of Life Sciences.⁷⁷ If this continues, the credibility of the Chinese scientific community will continue to be severely undermined on the world stage.

While China has allowed the establishment of some joint institutions of higher education, such as Duke Kunshan, NYU Shanghai and Hopkins-Nanjing, it is clear from limitations on international interaction and publishing that these are contained bubbles which in many cases do

⁷⁶ James Fallows, *China Airborne* (New York: Pantheon Books, 2012), 217.

⁷⁷ Fallows, 217.

not even maintain an acceptable level of academic freedom in and of themselves.⁷⁸ Duke Kunshan hosted China's first-ever international meteorite conference in 2017 "to make connections with Western scholars and Eastern scholars" but has yet to follow through on plans to repeat it.⁷⁹ NYU Shanghai, a joint Sino-US institution founded in 2012 by New York University and East China Normal University, was pitched as a safe haven for academic freedom in the spirit of building bridges for students between the US and China. Jeffrey Lehman, NYU Shanghai's founding vice chancellor, told a congressional committee in 2015 that NYU "would have absolute control over the school's curriculum, faculty, teaching style, and operations, and that it would receive an ironclad guarantee that it could operate the school according to the fundamental principles of academic freedom."⁸⁰ It has become clear, however, that NYU Shanghai is "ultimately controlled by the Chinese authorities, with NYU acting as something like a minority shareholder," with limitations surfacing in mandatory civics courses for Chinese students and discrimination lawsuits.⁸¹ Harvard University also relocated its Chinese language program from Beijing to Taipei, explicitly citing geopolitical tensions and "perceived lack of friendliness."⁸² Partially due to these trends, the educational exchange between the US and China is also lopsided, with 300,000 Chinese students in American universities and only 350 American students in China as of June 2023, according to US Ambassador Nicholas Burns.⁸³

⁷⁸ Oliver Staley and Daniel Golden, "China Halts U.S. Academic Freedom at Classroom Door for Colleges," *Bloomberg*, November 29, 2011, <https://www.bloomberg.com/news/articles/2011-11-28/china-halts-u-s-college-freedom-at-class-door>.

⁷⁹ Wang Yiwei, "Scientists and Meteorite Hunters Descend on Suzhou," *Sixth Tone*, September 18, 2017, <https://www.sixthtone.com/news/1000866>.

⁸⁰ Anastasiia Carrier, "Who's the Boss?" *The Wire China*, January 9, 2022, <https://www.thewirechina.com/2022/01/09/whos-the-boss/>.

⁸¹ Carrier.

⁸² Carrier.

⁸³ Juana Summers, "U.S. ambassador to China on future of the countries' complicated relationship," *NPR*, June 21, 2023,

Outside of foreign-influenced academic environments, there is no free flow of information, severely limiting the degree to which Chinese researchers can access and interact with the international scientific community. As writer and journalist James Fallows argues, “The Chinese government’s steady attempt to throttle its people’s connection with the outside world is... a profound threat to the future of any advanced industry.”⁸⁴ To conduct valuable and innovative research, much less foster new industry, free flow of information across borders is a must. As Richard Parris, an internet-technologist sums up, Chinese internet controls disproportionately inconvenience people “with ambitions to operate at the highest level of scholarship, scientific research, technical innovation, and other elements of truly first-rate international activity.”⁸⁵ This may also contribute to the phenomenon of brain drain if Chinese researchers and scientists feel that they cannot operate freely in their home country, which thereby would increase the hostility of China towards the foreign institutions attracting them.

Lastly, a July 2023 “counterespionage” law that has been instituted in China could exacerbate the fears that foreign entities, including but not limited to research institutions and businesses, have regarding establishing a presence in China. The law “bans the transfer of information related to national security and interests which it does not specify” leading to concern that “foreign companies in China could be punished for regular business activities.”⁸⁶ Furthermore, the Ministry of State Security posted on the Chinese messaging platform WeChat in early August 2023 that citizens should conduct their own counterespionage work as a

<https://www.npr.org/2023/06/21/1183578251/u-s-ambassador-to-china-on-future-of-the-countries-complicated-relationship>.

⁸⁴ Fallows, 207.

⁸⁵ Fallows, 214.

⁸⁶ Ryan Woo, “China wants to mobilise entire nation in counter-espionage,” *Reuters*, August 2, 2023, <https://www.reuters.com/world/china/china-wants-mobilise-entire-nation-counter-espionage-2023-08-01/>.

“normal” part of the system.⁸⁷ The US State Department said this was tantamount to “encouraging citizens to spy on each other” and is “closely monitoring the implementation of China’s new counter-espionage law... which, as written, greatly expands the scope of what activities are considered espionage.”⁸⁸ This recent update is chilling and points to an increasingly hostile environment for joint China-foreign work in the fields of innovation and science. Any spark in cooperation rests on foreign organizations and individuals being incentivized to travel to China, and as long as China maintains these policies, travel exchange will continue to plummet.⁸⁹

At the first stage, the US – for its part – must lessen its recent uptick in a new red scare mentality towards Chinese researchers, and continue to encourage international cooperation at its world class institutions of higher learning as well as engage in international science endeavors.

Federal funding in the US for Chinese-based research institutes has taken a sharp decline since COVID-19, adding another casualty to recent tensions between the two states. The US Department of Health and Human Services revealed in late July 2023 that it was cutting all grants and contracts with the Wuhan Institute of Virology over “possible biosafety concerns.”⁹⁰ Chen Xi, an associate public health professor at Yale University, said that there has already been a “fast decline” in research collaboration between US and Chinese institutes supported by NIH funding and that this development “further erodes trust between the two governments and

⁸⁷ Woo.

⁸⁸ Robert Delaney, “Under new law, China is ‘encouraging citizens to spy on each other’, US says,” *South China Morning Post*, August 3, 2023, <https://www.scmp.com/news/china/article/3229795/under-new-law-china-encouraging-citizens-spy-each-other-us-says>.

⁸⁹ Wenxin Fan, “China’s Latest Problem: People Don’t Want to Go There,” *The Wall Street Journal*, August 3, 2023, <https://www.wsj.com/articles/chinas-latest-problem-people-dont-want-to-go-there-7d17a83a>.

⁹⁰ Hayley Wong, “‘Mutual distrust’: the message in the US funding cut for China’s Wuhan Institute of Virology,” *South China Morning Post*, July 23, 2023, <https://www.scmp.com/news/china/diplomacy/article/3228640/mutual-distrust-message-us-funding-cut-chinas-wuhan-institute-virology>.

scientists in fundamental research that could prevent the next pandemic and other global health emergencies.”⁹¹ The role that federal funding plays in supporting international research institutes is crucial to maintaining those ties vis-a-vis the credibility of the US government. If this support continues to be taken away under shaky pretenses, trust will be challenging to earn back.

On an individual level, the recent treatment of Chinese students and scholars in the US is antithetical to the core values of academia and only serves to further harm cooperative efforts in science between the US and China, as well as undermine the world-class reputation the US currently enjoys in higher education. Since the Trump Administration launched the “China Initiative” in 2018 to monitor suspected intellectual property theft of American technology and scientific research, many Chinese researchers in the US are opting to return to China when the choice presents itself.⁹² Some researchers point to deteriorating US-China relations creating a “glass ceiling for Asians here” and also “decoupling of personnel [as] it’s extremely difficult for people to move between the two countries, given visa and flight restrictions.”⁹³ China launched the “Thousand Talents” program in 2008 to entice Chinese and foreign researchers to bring their research to China, but it hardly attracted any attention then.⁹⁴ Since the “China Initiative” began, China has begun muting mentions of the Thousand Talents program and its recruited scientists as they have come under intense scrutiny.⁹⁵ This has had myriad effects beyond the perceptions of individuals. From 2018-2021, the US has lost 896 scientific authors while China gained 3,108,

⁹¹ Wong.

⁹² Yvonne Sun, “China’s top overseas students face ‘glass ceiling’, hard choices amid fraught US ties,” *South China Morning Post*, July 22, 2023, <https://www.scmp.com/news/china/science/article/3228533/chinas-top-overseas-students-face-glass-ceiling-hard-choices-amid-fraught-us-ties>.

⁹³ Sun.

⁹⁴ Ellen Barry and Gina Kolata, “China’s Lavish Funds Lured U.S. Scientists. What Did It Get in Return?” *The New York Times*, February 6, 2020, <https://www.nytimes.com/2020/02/06/us/chinas-lavish-funds-lured-us-scientists-what-did-it-get-in-return.html>.

⁹⁵ Sun.

according to the Organisation for Economic Cooperation and Development.⁹⁶ The long-term stay rate of Chinese STEM PhD graduates in the US has decreased since the Trump administration, and the denial rates for F-1 visas (which allow foreign students to study at American universities and schools) increased from a low of 15 percent in 2014 to a record high of 35 percent in 2022, according to the CATO Institute.⁹⁷ The American academic community has taken notice and is resisting such trends. In 2021, a group of over 100 professors publicly called for an end to the “China Initiative,” saying it had “deviated significantly from its claimed mission, ... is harming the United States’ research and technology competitiveness and it is fueling biases that, in turn, raise concerns about racial profiling.”⁹⁸ Former US Energy Secretary and Nobel prize winner for physics Steven Chu pointed out that such actions would actually undermine US global leadership in science and academia: “We were the brain gain for half a century. You really want to throw this away?”⁹⁹ The parallels to the story of Qian Xuesen, the former CalTech professor who was expelled from the United States back to China during a red scare in the 1950s, are unmistakable. Even though the initiative has since officially been rolled back, the damage has been done and scientists of Chinese background still in the US are perpetually on edge.¹⁰⁰ The US, through its academic institutions and environment, has a strong foundation upon which to drive global collaboration in science. As Kun Dai, assistant professor of educational administration and

⁹⁶ Sun.

⁹⁷ Sun.

⁹⁸ Jane Lee, “Stanford professors urge U.S. to end program looking for Chinese spies in academia,” *Reuters*, September 14, 2021, <https://www.reuters.com/world/us/stanford-professors-urge-us-end-program-looking-chinese-spies-academia-2021-09-13/>.

⁹⁹ Lee.

¹⁰⁰ Sylvie Zhuang, “US-based scientists of Chinese origin still feel ‘chilling effects’ of Trump’s China Initiative,” *South China Morning Post*, July 6, 2023, <https://www.scmp.com/news/china/science/article/3226688/us-based-scientists-chinese-origin-still-feel-chilling-effects-trumps-china-initiative?module=inline&pgtype=article>.

policy at Chinese University of Hong Kong points out, “As long as there is no serious conflict between the two countries, the US will still be the priority for Chinese students to study for STEM PhDs. . . . The point is whether the high-end talent can really enjoy the benefits and feel they are respected.”¹⁰¹ The US must reverse course on this issue to make it clear that roads to international scientific collaboration run through the respected institutions of higher education in the US, with great resources and credibility at their disposal. Comments made by US Ambassador Nicholas Burns to Chinese students in September 2022 provide a glimmer of hope: “We are very proud the United States remains the top destination for Chinese students who choose to pursue education beyond China. I can say first-hand that the United States wholeheartedly welcomes international students, researchers, and scholars from China on US campuses. Through their creativity, innovation, and diverse perspectives, and I must say hard work, Chinese students enrich our colleges and universities as well as our surrounding communities.”¹⁰²

While the concrete steps the US and China must take at the first stage differ in many respects, they must both also strive to show public interest in working together on common issues such as climate change, disease prevention, preserving biodiversity and more, as a signal to the world and their own domestic populations that there are in fact issues that require collaboration in the interest of all the world’s inhabitants.¹⁰³ Such a signal would encourage other states to join in as well. By working together on these issues of basic science research that may

¹⁰¹ Sun.

¹⁰² “2022 Education Fair: Ambassador Burns Welcomes Students from China to Study in the United States,” US Mission China, September 27, 2022, <https://china.usembassy-china.org.cn/press-release-2022-education-fair-ambassador-burns-welcomes-students-from-china-to-study-in-the-united-states/>.

¹⁰³ Summers.

yield immediate tangible benefits, the other barriers of incompatible technology norms and organizational methods can be more easily addressed.

At the second stage, the US must also lessen its political barriers to space cooperation on the road to collaboration. First, it must consider amending the Wolf Amendment, which puts in place restrictive measures on contact between NASA and any China-related entities. As the Secure World Foundation stated in a 2020 report detailing recommendations: “Congress should modify the Wolf Amendment to allow NASA to engage in space activities with China that support US national interests. Priority areas for engagement include basic space science and research, robotic space exploration, and increased data sharing on space weather and orbital debris.”¹⁰⁴ Indeed, space science is a broad field and NASA’s activities are not limited to astronomy or human spaceflight. Planetary science, biology, physics, medicine and other fields have benefitted from research conducted in space. While NASA administrator Bill Nelson has argued the amendment should stay in force due to concerns about China staking claims on the moon, Roger Handberg, a political science professor at the University of Central Florida argues that practically speaking, “The two will be major players in deciding the rules, which means the Wolf Amendment will go so that productive work can be done.”¹⁰⁵ Hopefully, a more pragmatic outlook takes root to allow this to happen, which could happen as the US and China go further into space and need more communication established, both formal and informal, which could lessen the impact of such restrictions: “Over time, the amendment is effectively nullified through

¹⁰⁴ “Space Policy and Sustainability: Issue Briefing for the Biden Administration,” Secure World Foundation, December 2020, 21, https://swfound.org/media/207084/swf_space_policy_issue_briefing_2020_web.pdf.

¹⁰⁵ Ling Xin, “China and the US are reaching for same region of the moon. Could they work together?” *South China Morning Post*, May 21, 2023, <https://www.scmp.com/news/china/science/article/3220915/china-and-us-are-reaching-same-region-moon-could-the-y-work-together>.

exceptions, even though the title may remain,” Handberg says.¹⁰⁶ The US must also show some flexibility in its Artemis Accords framework, at a minimum to make it compatible with cooperation on the moon vis-a-vis similar Chinese plans. The existing situation of the Artemis Accords underlining US plans for the moon and the International Lunar Research Station doing the same for China’s plans creates a parallel dynamic that on its face may seem to be inherently hostile. But as Handberg points out, “The process of space exploration is difficult, complicated and expensive. Even the two powers may find the burden heavy, and the need for cooperative activities will become more obvious.”¹⁰⁷ Indeed, both states can build some mutual trust by building relations in space based upon commonly shared tangible difficulties of operating in such unforgiving terrain. Such areas of overlap could include “sharing data on tracking objects in orbit to avoid collisions or on space weather forecasting of events that can interfere with electronics on Earth,” according to Ian Christensen, director of private sector programs at the Secure World Foundation.¹⁰⁸ The nature of both Artemis and the ILRS as being multilateral programs also may provide more incentive to build communication either directly or at international space forums such as the United Nations Committee on the Peaceful Uses of Outer Space. Thereby, the leadership status of both the US and China can coexist with bilateral cooperation. Some companies, such as nanoSPACE AG and the International Lunar Observatory Association, are also simultaneously involved in both Artemis and the ILRS initiatives, providing more opportunity for overlap through the private sector.¹⁰⁹

¹⁰⁶ Xin.

¹⁰⁷ Xin.

¹⁰⁸ Feldscher.

¹⁰⁹ Ling Xin, “Western companies drawn to China’s lunar research station project,” *South China Morning Post*, July 7, 2023, <https://www.scmp.com/news/china/science/article/3226845/western-companies-drawn-chinas-lunar-research-station-project>.

At the same second stage, China must show increased willingness to cooperate in space affairs as well as increase the transparency of its space sector to make cooperation more palatable to countries and other entities. The US encounters a fundamental opacity of China's space sector, and while some of that may lie in US ignorance, "China is more secretive than most when it comes to space."¹¹⁰ Of course, China does not have a singular space agency, and "part of the problem is that the People's Liberation Army runs China's spaceports and its crewed space missions. So it is difficult to distinguish between China's civilian space activities and its military ones."¹¹¹ One product of this is that "Chinese space diplomacy is not uniform regarding international scientific co-operation," and has a "bifurcation in approaches," with *Tiangong* seeking partners through UN channels but the ILRS using only national and bilateral methods.¹¹² The end result is "an intriguing puzzle concerning international co-operation [where] practices of institutionalised multilateral co-operation and areas of state-centric bilateral co-operation co-exist in this case and further complicate the issue of space diplomacy."¹¹³ The news the world receives about Chinese space developments is usually too little too late. *Tiangong* spacewalks are usually announced after the fact (ISS spacewalks are usually livestreamed), months passed before the admittal that China's Mars rover *Zhurong* could not power on after hibernation, and falling debris from Chinese boosters was detected without advance warning.¹¹⁴ Chinese developments in private rocket development have also raised important questions about the

¹¹⁰ "China is unusually secretive about its space programme," *The Economist*, May 18, 2023, <https://www.economist.com/china/2023/05/18/china-is-unusually-secretive-about-its-space-programme>.

¹¹¹ "China is unusually secretive about its space programme," *The Economist*, May 18, 2023, <https://www.economist.com/china/2023/05/18/china-is-unusually-secretive-about-its-space-programme>.

¹¹² Mai'a K. Davis Cross and Saadia M. Pekkanen, "Introduction. Space Diplomacy: The Final Frontier of Theory and Practice," *The Hague Journal of Diplomacy* 18, 2-3 (2023): 207.

¹¹³ Cross, 207.

¹¹⁴ "China is unusually secretive about its space programme," *The Economist*, May 18, 2023, <https://www.economist.com/china/2023/05/18/china-is-unusually-secretive-about-its-space-programme>.

relationship between the military and private industry in the space sector. As Ji Wu, a Chinese expert in space science says, “The [Chinese] commercial space market has been slowly and cautiously opening up under government guidance.”¹¹⁵ As the opening of this sector has been under the watch of the government, it remains unclear whether these companies have the ability to do business independently with international entities.¹¹⁶ Furthermore, increased transparency from the Chinese side would allow addressing organizational challenges by offering better understanding of the Chinese space sector: The Secure World Foundation believes that this is key to any breakthrough in US-China relations in space: “Congress should work with the administration to fund and carry out studies that systematically document and understand the structure and nature of the Chinese space ecosystem, how the industry is structured, the true relationships between the central government, the state-owned enterprises, and the private companies, the role of the provincial governments, how private capital operates in the Chinese space sector and how all of this relates to the space program priorities of the Chinese government.”¹¹⁷ In the current bilateral political context, however, the US cannot conduct such investigations itself without being subject to serious allegations of espionage. Additionally, the US can only provide so many further incentives and China has a largely self-sufficient space program. Therefore, China has the agency to itself choose whether it is ready to sacrifice some secrecy in order to potentially reap the extra benefits of international cooperation in space affairs.

¹¹⁵ Ling Xin, “China catches up in commercial space: an interview with Ji Wu,” *National Science Review* 9, no. 7 (July 2022), <https://doi.org/10.1093/nsr/nwac065>.

¹¹⁶ Xin.

¹¹⁷ “Space Policy and Sustainability: Issue Briefing for the Biden Administration,” Secure World Foundation, December 2020, 21, https://swfound.org/media/207084/swf_space_policy_issue_briefing_2020_web.pdf.

Clearly, cooperation in space between the US and China will not arise as a result of merely continuing on the current trajectory. On the contrary, with all the aforementioned political and logistical barriers, sustained political will and resources will be necessary. A spark of such political will has appeared in some of the Biden administration's internal discussions. Pam Melroy, a former astronaut who served on Biden's NASA transition team and is now NASA deputy administrator said "trying to exclude them [China] I think is a failing strategy. It's very important that we engage."¹¹⁸ Furthermore, nearly two dozen former astronauts, government officials and space experts interviewed by *Politico* in 2020 "agreed that America could lose its position as the global space leader if it shuts Beijing out entirely."¹¹⁹ But the necessary long-term resources (which would have to come from a skeptical Congress) and matching initiative from China seem to be a doubtful proposition at present. While aiming for immediate cooperation in space may be a tall order, basic scientific collaboration not only holds more tangible incentives, but may also be a potential force to tackle both the most pressing scientific and diplomatic issues facing the world today. The Biden Administration recently deciding to extend the Agreement Between the United States and China on Cooperation in Science and Technology, first signed in 1979 and usually renewed every five years, is a laudable step in service to this goal.¹²⁰ Then, scientific collaboration can extend into such adjacent fields as "Space weather, scientific research, exploration, capacity building for disaster response, and global environmental monitoring, [which] are all areas where the United States and China share joint interests and could collaborate with each other and other interested countries to help establish broader

¹¹⁸ Feldscher.

¹¹⁹ Feldscher.

¹²⁰ Jeffrey Mervis, "White House requests extension of agreement with China on joint research," *Science*, August 24, 2023, <https://www.science.org/content/article/white-house-requests-extension-agreement-china-joint-research>.

relationships outside the military realm.”¹²¹ For these reasons, a two-stage approach with the first stage seeking common ground on basic science is a suitable starting point towards the larger goal of cooperation in space affairs.

Conclusion

In the early 1960s, President Kennedy had an idea perhaps even more formidable than shooting for the moon solo. Faced with the perpetual prospect of nuclear armageddon, “Kennedy viewed the prospect of giving up a chunk of national prestige by pursuing a joint US-Soviet moon mission as eminently sensible.”¹²² It would indeed save money for both superpowers, give the US access to the secretive Soviet space program and also undoubtedly bring international acclaim for both Kennedy and Soviet Premier Khrushchev.¹²³ Of course, as much as the prospect was alluring, the intelligence risks and logistical challenges were as much if not more daunting, as earnestly conveyed to him by James Webb, Lyndon Johnson, McGeorge Bundy and Robert McNamara among many others in his administration and Congress.¹²⁴ Kennedy, though, had distanced himself from the simple Cold War polarity thinking, so that “even though he himself had framed winning the race to the moon as essential for America’s national pride, he was willing to possibly sacrifice the win if doing so built a bridge for peace.”¹²⁵ It seemed that Kennedy was seeking to play political scientist Robert Putnam’s two-level game his own way. On September 20th, 1963, Kennedy addressed the United Nations General Assembly:

In a field where the United States and the Soviet Union have a special capacity—in the field of space—there is room for new cooperation, for further joint efforts in the regulation

¹²¹ Brian Weeden, “An Opportunity to Use the Space Domain to Strengthen the U.S.-China Relationship,” Brief from U.S. China Relations in Strategic Domains, *The National Bureau of Asian Research*, September 9, 2015. <https://www.nbr.org/publication/an-opportunity-to-use-the-space-domain-to-strengthen-the-u-s-china-relationship/>.

¹²² Brinkley, 417.

¹²³ Brinkley, 417.

¹²⁴ Brinkley, 420.

¹²⁵ Brinkley, 421.

and exploration of space. I include among these possibilities a joint expedition to the moon. Space offers no problems of sovereignty... Why, therefore, should man's first flight to the moon be a matter of national competition? Why should the United States and the Soviet Union, in preparing for such expeditions, become involved in immense duplications of research, construction, and expenditure? Surely we should explore whether the scientists and astronauts of our two countries—indeed of all the world—cannot work together in the conquest of space, sending someday in this decade to the moon not the representatives of a single nation, but the representatives of all of our countries.¹²⁶

No one in the assembly hall nor in DC saw the proposal coming, so while “representatives from around the world cheered enthusiastically... In Washington, the speech landed with a jolt, stunning senators and congressmen of both parties. White House advisors, the Joint Chiefs, and the CIA were flabbergasted.”¹²⁷ The USSR, however, responded with radio silence. Backed into a corner, Kennedy admitted at an October 9th press conference, “We have had no indication, in short, that the Soviet Union is disposed to enter into the kind of relationship which would make a joint exploration of space or to the moon possible. But I think it is important that the United States continue to emphasize its peaceful interest and its preparation to go quite far in attempting to end the barrier which has existed between the Communist world and the West.”¹²⁸ When the Kremlin finally sent a response to the proposal on October 25th, Khrushchev mockingly not only rejected a joint-lunar mission but also announced that the USSR had no interest in a moon mission itself.¹²⁹ The US, invigorated by the notion that it should not succumb to “Moscow’s ploys,” pushed on with its own moon mission and thereby, “Khrushchev helped NASA out more than he ever realized.”¹³⁰ While the proposal itself never came to fruition (though Kennedy and even Khrushchev made mention of it indicating “residual interest” over the following few

¹²⁶ Brinkley, 423-4.

¹²⁷ Brinkley, 424.

¹²⁸ Brinkley, 425.

¹²⁹ Brinkley, 427.

¹³⁰ Brinkley, 427.

months), Kennedy's speech "proved a propaganda windfall for democracy versus communism, winning hearts and minds... and leaving a humanitarian glow in its wake."¹³¹ This was so much the case that historian Walter A. McDougall argued that Kennedy's speech and other overtures for cooperation in space with the USSR "were just exercises in image building."¹³² While it may be difficult to fully ascertain all the rationales informing Kennedy's decision (the existential moment of the Cuban Missile Crisis had also just passed), the outcome still leaves one wondering how the history of human endeavors into space could have unfolded if such a joint mission had happened. While China and the US are in no position at present for a joint lunar mission, it is clear that the possibilities for cooperation and collaboration abound and deserve careful consideration, keeping in mind that the impact of choices made now will have tremendous ripple effects for the future of human space endeavors.

The relationship between the US and China in all matters is complicated, and their relations through the lenses of science and space affairs are no exception. The issues at the core of the contentious relationship between these two states will not be solved by a few policy changes here and there, especially not in a short timeframe. But every journey begins with a simple step, and it is clear that any steps to improve science diplomacy between the US and China would represent monumental progress and set up a potential path for the larger goals of space cooperation and collaboration. While it is true that "historically, cooperative space projects have been a lagging indicator of relations between countries rather than a primary mechanism for lowering tensions," this trend can be bucked with decisive action now.¹³³ Beyond space, Brian Weeden of the Secure World Foundation claims, "The US-China relationship in space has the

¹³¹ Brinkley, 428.

¹³² Brinkley, 424.

¹³³ Bateman.

potential to be a stable foundation for a stronger overall relationship between the two countries.”

¹³⁴ Indeed, there is enormous potential to spark more science diplomacy as “scientists all over the world are connected to each other through ‘invisible colleges,’ networks organized around scientific disciplines or problems. As such, the scientific community has been an international actor independent of the concerns of states.”¹³⁵ The dominant political dynamics present in US-China relations, however, have placed numerous blockades on such bridges which, it is clear, many scientists are against regardless of nationality.¹³⁶

This paper has certain shortcomings linked to the focus on these two state actors alone as a means to resolve rising tensions in space affairs. For the sake of argument, this paper adopts the limited framework of two nation-states (the US and China) as the core actors in the realm of space affairs. In the short history of human space endeavors, nation-states have until recently been the primary actors in this realm, and as a result, “space history is often written as a history of national programs, or of cooperative programs between states.”¹³⁷ This leaves open a glaring blind spot, which is the possibly monumental role that private industry could play in the future of space endeavors, including in establishing cooperation between peoples that was once thought impossible due to political concerns. Indeed, “Advocates of the commercial space peace, who are mindful of the challenges in contemporary geopolitics, argue nonetheless that the ‘chance of conflict in space is less than commonly understood or recognised precisely because of the extent to which the global economy has become dependent on space-based assets.’”¹³⁸ This paper in its

¹³⁴ Weeden.

¹³⁵ Luk Van Langenhove, “Who Cares? Science Diplomacy and the Global Commons,” *AQ: Australian Quarterly* 90, no. 4 (2019): 21.

¹³⁶ Ian Sample, “US scientists boycott Nasa conference over China ban,” *The Guardian*, October 4, 2013, <https://www.theguardian.com/science/2013/oct/05/us-scientists-boycott-nasa-china-ban>.

¹³⁷ Neufeld, xii.

¹³⁸ Cross, 199.

analysis and recommendations, however, also highlights the influence that governments have over academia and business, and therefore places the ultimate responsibility for improving relations in space affairs with the governments of the US and China. Its recommendations, focused on bolstering academia and business, also rest on the assumption that unlike in the first space race, militaristic concerns need not and ought not be the fundamental impetus for space endeavors. Furthermore, this paper offers recommendations for the US and China to resolve differences without analyzing the role that other states themselves could play. Spanish diplomat José-Miguel Bello y Villarino, for instance, argues that “the European Union is the only global actor that has all of the tools necessary to assist in the establishment of confidence-building measures between China, Russia, and the US in the domain of space.”¹³⁹ Still, any practical view of space affairs or science diplomacy must recognize the outsized role of powerful states: “Scientific advancements in space make strong contributions to soft power and the idea that we as humans have more in common than issues that divide us, but they also raise issues of technological innovation and commerce that underwrite the wealth of nations.”¹⁴⁰ The space environment, while growing with new actors, is still severely limited. Therefore, it would behoove any researcher in this field to examine carefully any and all possible options for reconciling tensions in space, including but not limited to incorporating nongovernmental entities and third-party states.

The historical foundation of this paper has a philosophical purpose beyond providing mere background, because as young as the history between the US and China is, there is much

¹³⁹ José-Miguel Bello y Villarino, “Preventing a Cold War in Space Using European Research and Innovation Programs,” *Science & Diplomacy, American Association for the Advancement of Science*, <https://www.sciencediplomacy.org/article/2019/preventing-cold-war-in-space-using-european-research-and-innovation-programs#note26%20rel=>.

¹⁴⁰ Cross, 199.

that we must strive not to repeat. As a Secure World Foundation report aptly characterizes it, “China’s space program in many ways originated as a result of US national security fears,” through expelling Qian Xuesen to China.¹⁴¹ The SWF report further adds, “This set the tone for much of the way the United States has viewed China’s space program: with great suspicion and responses that often exaggerated the threat while simultaneously creating the exact circumstances they were trying to prevent.”¹⁴² Put more plainly by Fraser MacDonald, “Nothing propels China’s planetary ambitions more than misguided attempts by the United States to play hardball.”¹⁴³ Indeed, not only has the intention of such policy often been shortsighted, but its execution has now brought humanity into an even more untenable situation. There is a pressing responsibility to rectify such mistakes without delay. Science diplomacy potentially offers the tantalizing prospect of reducing political conflict and simultaneously addressing global issues through collaborative innovation. Space diplomacy, however, brings an even more existential dimension into the picture, one that like the “overview effect” may serve to lessen our nationalism in pursuit of common goals, including our very survival. In the words of Stephen Hawking, “I don’t think the human race will survive the next thousand years, unless we spread into space. There are too many accidents that can befall life on a single planet.”¹⁴⁴

¹⁴¹ “Space Policy and Sustainability: Issue Briefing for the Biden Administration,” Secure World Foundation, December 2020, 20, https://swfound.org/media/207084/swf_space_policy_issue_briefing_2020_web.pdf.

¹⁴² “Space Policy and Sustainability: Issue Briefing for the Biden Administration,” Secure World Foundation, December 2020, 20, https://swfound.org/media/207084/swf_space_policy_issue_briefing_2020_web.pdf.

¹⁴³ MacDonald.

¹⁴⁴ Eli Meixler, “Remember to Look Up at the Stars.’ Read Some of Stephen Hawking's Most Memorable Quotes,” *TIME*, March 14, 2018, <https://time.com/5198842/stephen-hawking-quotes-universe-life/>.

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